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CHANGES IN PHEASANT POPULATIONS AND LAND USE
ON THE PRAIRIE FARM¹

by

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It has long been evident that the pheasant in this country is a bird of agriculture. Also, it has become quite apparent that, within the limits of its range, the better the agriculture the better things are for this species. From the nature of the bird's requirements, however, it seems obvious that even the pheasant can have too much agriculture; that there must be a point where increasingly intensified use of even the most fertile and productive farmland will, through reduction of effective winter cover, eventually result in lower ringneck potential. Yet we find in Michigan that, in general, our best and most intensively used farmland continues to produce the state's highest bird populations. We are led to suspect that the ringneck can get along with less winter cover than we had supposed. Just how much cover does the pheasant need? At what point does cleaner farming become critical? What can we expect in the future on lands that are year by year being cropped more intensively?

One approach to answering these questions is to study case histories, to examine the records of specific areas where both land use history and pheasant population figures are available. The 8,400-acre Prairie Farm in Saginaw County, Michigan is such an area. We have had the opportunity there of observing both pheasant numbers and land use changes in enough detail and over a long enough period to establish some apparent relationships. In recent years the fertile acres of this area have been pushed to high level production, and it now looks as though farming may have gotten the best of the pheasant. The available data on Prairie Farm land use and pheasant numbers are summarized in this paper.

Shick (1952), in his detailed report on Prairie Farm pheasant studies, concluded that up through 1942, at least, conditions for pheasants improved as cropping increased on the area. He felt that by the early 1940's when his study terminated the area was at an optimum for pheasants and that they were limited neither by food nor cover deficiencies. MacMullan (1949) in comparing Prairie Farm conditions in the late 1940's with those on Pelee Island, Ontario, indicated that things were not as they used to be on the farm and he suggested that a recent trend toward clean farming had reduced the Michigan area's pheasant potential. The available facts appear to bear out this view. Pheasant numbers on the Prairie Farm have recently shrunk to a fraction of their former abundance, and some drastic changes in cover and crops have occurred. The present paper represents a compilation of Prairie Farm pheasant and land use data bringing Shick's information up to date with figures obtained in subsequent less detailed investigations conducted as part of a Pittman-Robertson research project.

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First of all, a word of explanation about the Prairie Farm. Its name should not be taken to mean that the area is of true prairie origin in the ecological sense of the term. It was, in fact, once marshland and swamp hardwood forest, part of the flood plain of the Saginaw River near its mouth in Saginaw Bay. The rich, poorly drained clay and muck soils of the area were reclaimed for agricultural use some 50 years ago by means of a system of drainage canals and surrounding dykes. Exhaust pumps lower the water table within the dykes in spring flood periods to the extent that field work on the farm is normally several weeks ahead of adjoining lands.

The 8,400 acres within the dykes were owned and operated by a cooperative group in the early 1930's. During the depression the unit was taken over by the federal government and controlled by the Farm Security Administration. Parcels were leased annually to local farmers who operated them largely on a cash crop basis. During World War II the land was returned to private hands and the area is now owned and operated by a number of individual farmers.

As in the rest of the state, pheasants got their start on the area with a few rather small releases during the period 1915 to 1920. By 1937, when records were begun, ringnecks were well established and thriving on the Prairie Farm. For several years an intensive, year-around pheasant research program was carried on by the Michigan Department of Conservation, and a great deal was learned about population dynamics on the area. A complete check of hunters was made possible by a permit system of public hunting and by the limited access to the area. Since this study closed in 1943 a series of less detailed investigations and an annual bag check have kept population figures reasonably complete and up to date.

As may be seen from the graph in Figure 1 pheasants on the Prairie Farm quite definitely have had their ups and downs during the past 16 years. They climbed from moderate numbers in 1937 to a fluctuating high level in the early 1940's, then plunged to an unprecedented low in 1948. A disappointingly slow recovery in two successive years raised numbers only slightly, and they have now leveled off at a point only one tenth as great as their former abundance.

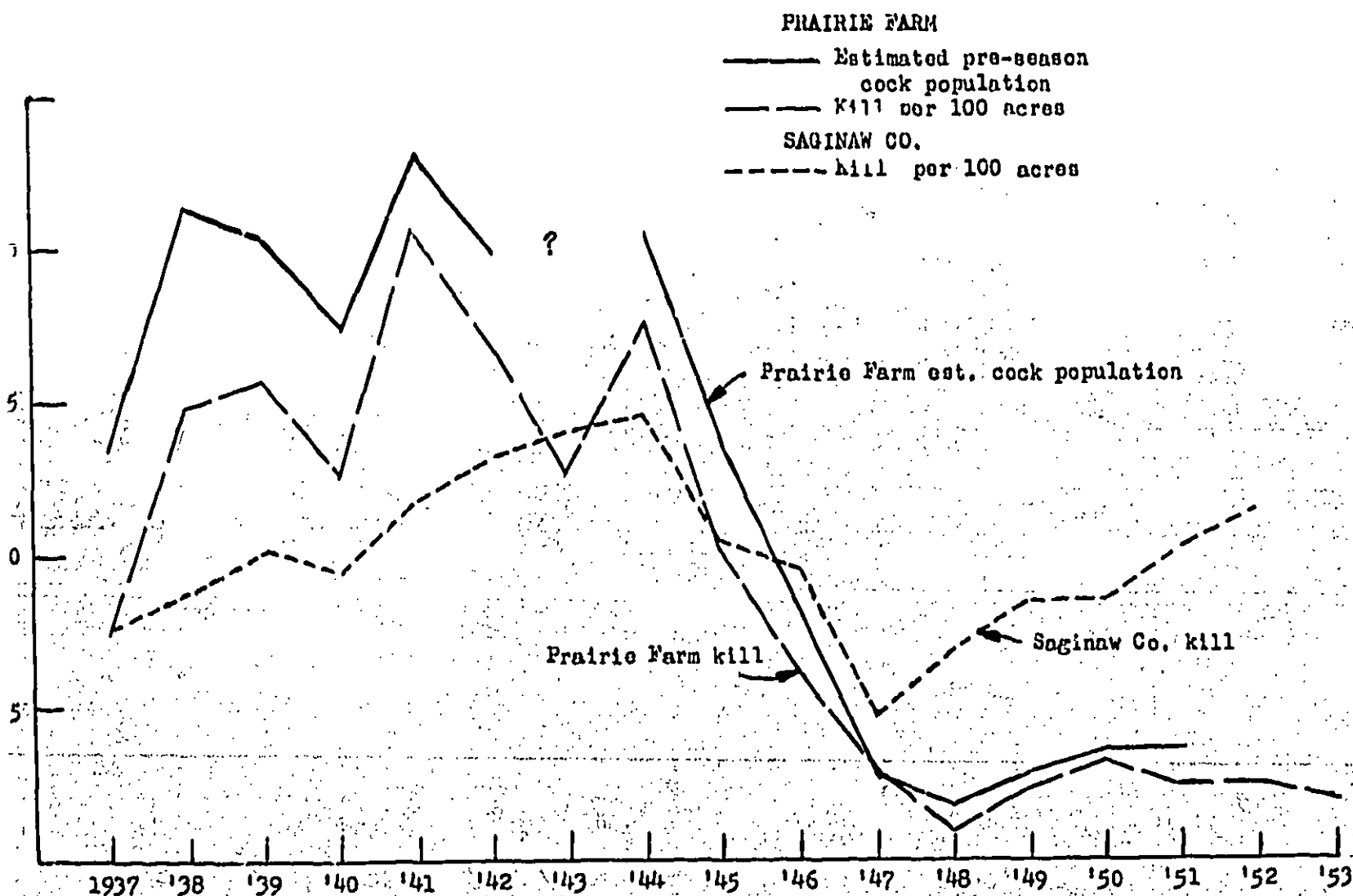
MacMullan (1950) has pointed out that though the extreme low of 1948 was due in part to spring flooding that year, the area was soon repopulated from adjoining territory and in two years had fully recovered from effects of that catastrophe. The flooding, though it accentuated the low, was responsible neither for the already occurring decline nor for the subsequent failure to recover fully.

Pheasant harvest on the farm during the 16 years has followed populations quite closely. Kill has ranged from 60 percent to 90 percent of pre-season cock populations. The high years of the early 1940's yielded harvests as great as 15 to 20 cocks per 100 acres, and bags since 1948 have remained between 2 and 3 cocks per 100 acres.

The area was subjected to phenomenal hunting pressures during the high years. Seasonal totals as great as 200 gun hours per 100 acres are reported by Shick and, as he points out, these extreme pressures did not result in over-harvesting cocks. High productivity was maintained and perhaps even stimulated by this close cropping during the years of high population.

Cocks per 100 acres

Figure 1. PHEASANT POPULATION CHANGES
PRAIRIE FARM AND SAGINAW COUNTY
1937-1953



Taking a look at pheasants outside the area on similar quality range we find that the kill trend in Saginaw County was upward to a peak in 1944, then a slump to a low in 1947, and a steady recovery since (see Figure 1). These ups and downs roughly match those of the Prairie Farm yet they show important differences. The rise to former abundance was not as spectacular, the slump was not as deep and recovery has been much more satisfactory. Kill in Saginaw County now stands at about 80 percent of what it was in the peak year, and on the Prairie Farm it is now only 10 percent of its former high.

The trend in state-wide pheasant kill, as computed from hunter report cards, looks much like that of Saginaw County. Greatest kill was in 1944, a slump beginning in 1945, reached a low in 1947. A fairly steady climb since then has brought the current harvest up to about 75 percent of the 1944 peak. In some counties the kill during the past two years has been higher than any previous year.

From such comparisons it is obvious that Prairie Farm pheasants have not kept up with the current trend displayed by most of the state's ringneck population. Birds on the area appear to have followed state-wide changes up until the slump period. From then on they have failed to conform. Their downward slide was more precipitous, they dropped lower, and they have recovered scarcely at all. Some continuing misfortune has befallen them.

Now, for a look at land use changes on the farm during the period. Briefly, they have all been in one direction--more intensified and more efficient farming with an increasing proportion of the land under cultivation. Figure 2 compares the percentages of cultivated and uncultivated land for the years 1937, 1941, 1949, and 1953. From 1937 to 1941 the cultivated portion increased from about 30 percent to around 70 percent of the area. Shick (1952) pointed out that this change was largely beneficial to pheasants since it greatly increased food supplies without seriously reducing or impairing the various kinds of cover required by pheasants at different times of the year. He felt that winter cover in 1941 was more than adequate and that an additional 25 to 30 percent of remaining cover could be removed without being detrimental to pheasants. Since that date the cultivated area of the farm has increased steadily, and the loss of potential winter cover has amounted to at least 45 percent. The Prairie Farm now is 83 percent cultivated land.

Uncultivated land on this area consists of woodlots and mixed brushy and herbaceous growth. The woods are a swamp hardwood mixture, largely elm, ash, and soft maple. Most of the woodlots have been pastured in the past and have little undergrowth. Brushy and herbaceous cover is composed mainly of grasses, sedges, goldenrod, giant ragweed, willow, and aspen reproduction in varying amounts and mixtures. The brushy, weedy areas and the ungrazed woodlots all provide excellent winter shelter for pheasants. Ditches, spoilbanks, dykes, and roadsides when left untouched rapidly grow up to dense weedy, brushy travelways. In the days of federal ownership there was little maintenance on the roads or canal system, and the farm was interlaced with a network of such fine pheasant travel lanes and nesting sites. In recent years private owners have given much more attention to cleaning up such areas. Ditches now are dredged out periodically, spoilbanks and roadsides are cultivated to keep down weeds, and only a few of the larger dykes remain grown up to any extent. It should be pointed out that while these changes represent shrinkage in pheasant cover they do not show up in the figures on changes in area of tilled and untilled land since the ditch-dyke-road system has continued to be classed as uncultivated land and occupies roughly the same area throughout the period.

Figure 2. PRAIRIE FARM LAND USE. PERCENT OF AREA UNCULTIVATED.

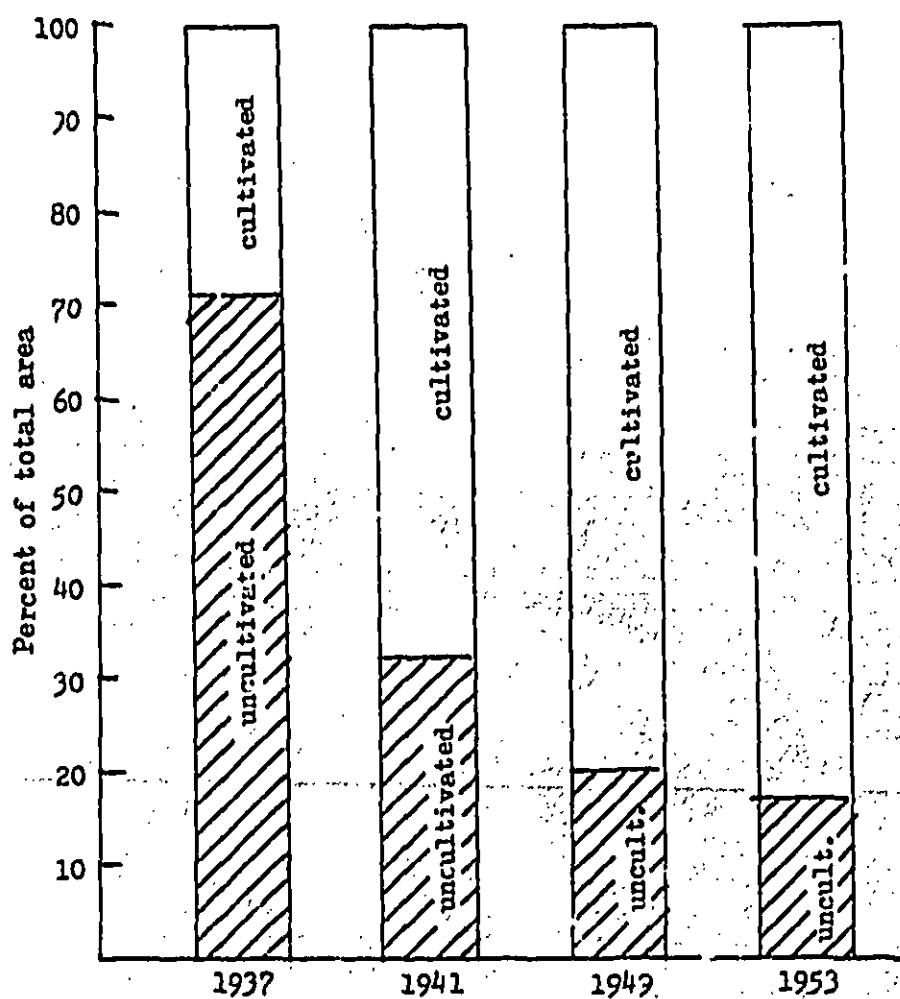





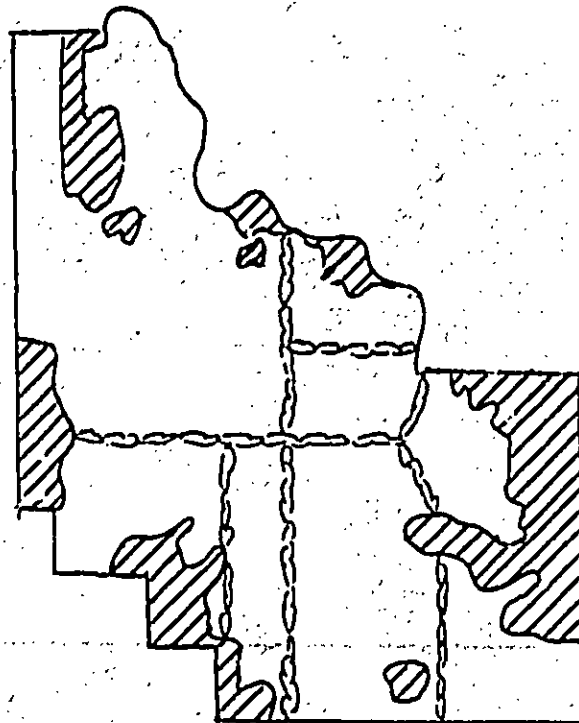
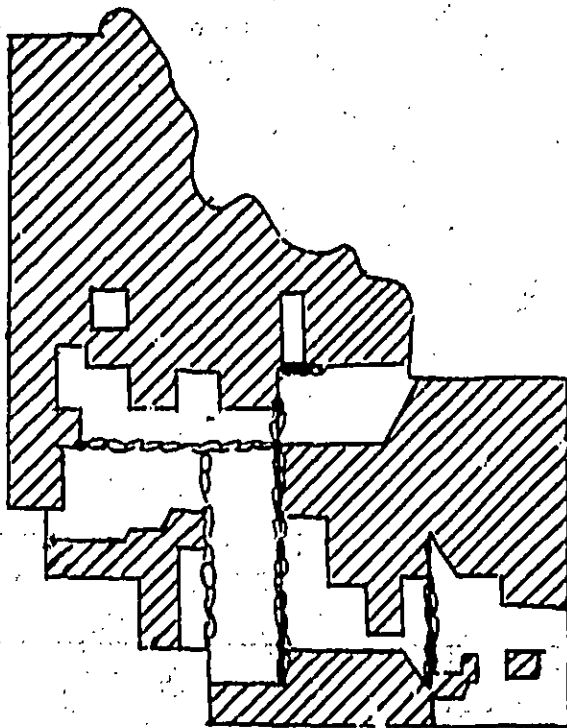
Table 1. PRAIRIE FARM CROPS

Crops	1937		1941		1949	
	Acres	Percent	Acres	Percent	Acres	Percent
Small grain	1,041	43	421	7	4,055	61
Beans	36	2	1,889	33	992	15
Beets	652	27	1,685	30	1,081	16
Corn	314	13	664	11	162	2
Hay	105	4	212	4	10	--
Cucumbers	23	1	268	5	372	6
Misc. Truck	239	10	--	--	--	--
Fallow	--	--	570	10	--	--
Total	2,410	100	5,709	100	6,672	100

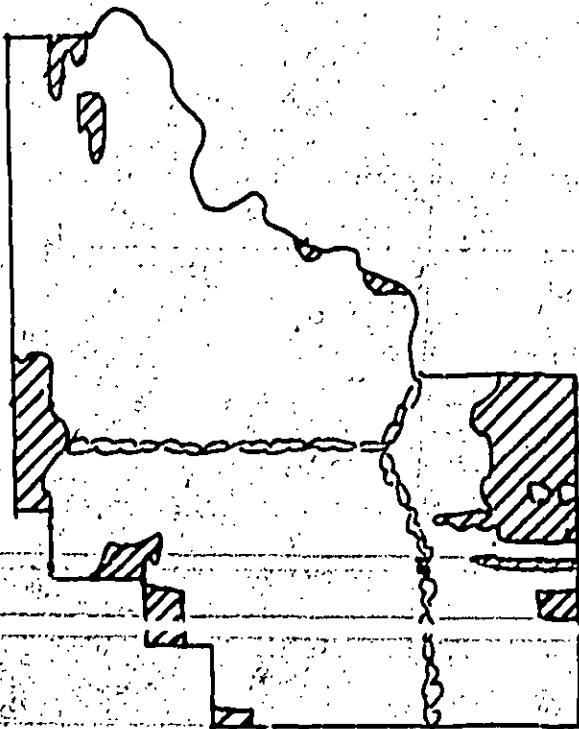
Figure 3. CHANGES IN UNCULTIVATED LAND ON THE PRAIRIE FARM
1937-1953

-  - Cultivated land
-  - Uncultivated land
-  - Brushy dykes and ditch banks

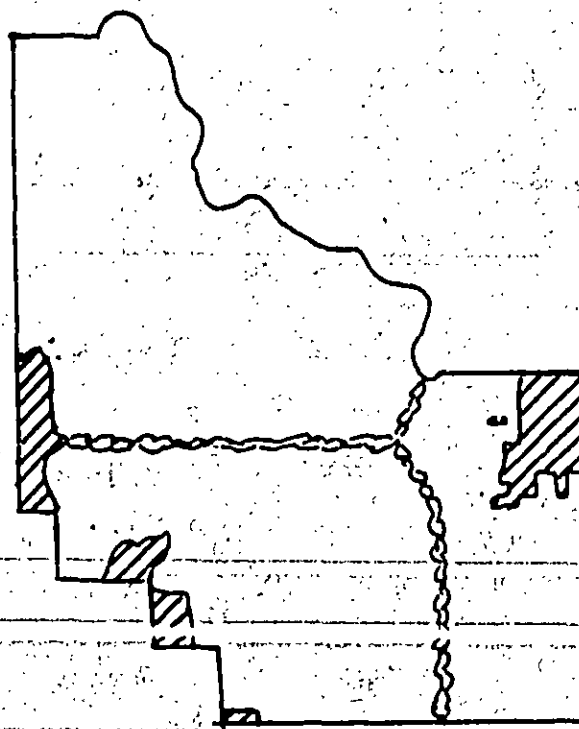
scale
0 1 2 mi.



1941



1949



1953

In Figure 3 the diagrams show how the uncultivated areas have been continually reduced in size and number and are at present (1953) restricted to a few scattered locations on opposite sides of the farm. Only one of these is of value to pheasants. The four areas on the west side are woodlots, once pastured and now little used by pheasants. The one piece of untilled land on the east side, largely brush and brushy woodlot, provides excellent pheasant cover and is a heavily used winter concentration area. This brushy patch and the remaining brushy interior dykes are the only effective winter cover areas left on the Prairie Farm. The land that has been put into cultivation since 1941 was largely of the brushy-weedy type, all excellent winter cover and frequently used for nesting.

Changes in percentage composition of Prairie Farm crops have been drastic during the period of record. In the years of pheasant buildup main crops were small grains (largely winter wheat and barley), sugar beets, and corn. In 1937 these crops occupied respectively 40 percent, 25 percent, and 13 percent of the cultivated area. At the time pheasants were most plentiful, 1941, emphasis had shifted from small grains to white beans (navy beans), which then were grown on 33 percent of the cropland. Beets still occupied around 30 percent, corn was grown on 11 percent, and small grains on 7 percent of the farm. Also in that year 10 percent of the cropland stood fallow. In the years since pheasant numbers have turned downward there has been a shift back to small grains. In 1949 they were grown on 61 percent of the cultivated acreage; beets and beans occupied nearly equal areas, 16 and 15 percent respectively, and corn had dropped to a very low acreage, only 2 percent of the cropland. In addition to main crops relatively small acreages of hay and of special crops such as cucumbers, mint, and potatoes have been raised each year. Recently some of the beans have been soybeans.

In the years of pheasant abundance crop wastage was much greater than now. Shick estimated that on an average 25 to 30 percent of all crops planted remained unharvested, either as residue or because of abandonment. Fields were frequently abandoned because of inferior quality or excessive weediness of the crops. Also, in those days, with poorer drainage and little road maintenance, getting equipment on the land was a major problem in both spring and fall, and every year there were some fields that just couldn't be harvested. What that meant to pheasants on the area is easy to imagine.

Frequent fallowing of fields also resulted from this ever present problem of getting on the land. Fields that couldn't be worked in the spring were left fallow and they quickly grew up to dense stands of weeds. It was estimated that at least 20 percent of the farmland stood idle each year for this reason.

In recent years there has been very little of this inefficient use. Much of the area has been tilled, ditches are kept open, and roads are improved and now maintained by the county. All fields are worked every year, and only an occasional bean field is abandoned in the fall because of excessive weediness.

Fall plowing has increased greatly on the area since 1942. In the days of federal ownership tracts were leased to operators on an annual basis, and few lessees took the chance of turning fields in the fall they might not lease again in the spring. Now, under private operation, fall plowing is the rule, weather permitting, and we find that about half the cultivated area is plowed in the fall.

All these factors combine to make the present Prairie Farm a bleak and barren landscape in winter. The bare ground of fall plowed fields, the many acres of winter wheat, the clean ditches and spoilbanks, all useless to pheasants, are in marked contrast to the area that once was judged to have a superabundance of both food and cover. In recent winters pheasants have largely been restricted in their activities to the only remaining extensive cover area, about 200 acres of brush and weeds along the east dyke. The farm now winters flocks of only a few hundred birds where once there were numbers as high as 2,000.

Here, in summary, are the facts on Prairie Farm pheasants and land use changes. Pre-hunting season cock populations climbed from 13.7 per 100 acres in 1937 to a high of 22.9 in 1941. They then, in common with the state-wide trend, began to fall off rapidly. By 1947 they were down to 2.8, only 12 percent of their previous high. Populations in surrounding Saginaw County by that year had dropped to a point around 30 percent of what it had been. In 1948 flooding further reduced Prairie Farm numbers to a low point of 1.7 cocks per 100 acres. That year in Saginaw County and the rest of southern Michigan ringnecks began a rapid recovery which by 1952 had returned them to a position some 75 percent as high as the previous peak. Prairie Farm pheasants, in contrast increased moderately for two years then leveled off and are now only about 15 percent as numerous as in their high years. Cultivation of the Prairie Farm has progressed from 30 percent of the area in 1937 to 70 percent in 1941, and to 83 percent in 1953. This trend reduced the various kinds of cover required by pheasants at different times of the year. Crops have changed from beans, sugar beets, and corn in 1941 to wheat and barley, beets, and beans at the present time. Fall plowing has increased and drainage has been greatly improved. Field borders, ditch banks, and roadside areas all of which provided good nesting sites have been cleaned up. In general, the land is being used much more efficiently than it ever was before. It appears that pheasants benefited greatly as more and more of the wet, fertile soil was reclaimed and farmed; but as cultivation continued to increase, and farming was intensified, a point of diminishing returns was reached, and now pheasants on the Prairie Farm have become a shrunken by-product of a highly productive farming area.

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